Annual Report of Activities

October 1, 2010 to September 30, 2011

American River Group (ARG)

October 2011

Acronyms and Abbreviations

ARG	American River Group
BiOp	Biological Opinion
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CDEC	California Data Exchange Center
CDFG	California Department of Fish & Game
CWT	Coded Wire Tag
DWR	California Department of Water Resources
ESA	Endangered Species Act
FMS	Flow Management Standard
LAR	Lower American River
MRR	Minimum Required Release
NMFS	National Marine Fisheries Service
Reclamation	U.S. Bureau of Reclamation
RPA	Reasonable and Prudent Alternative
SAFCA	Sacramento Area Flood Control Agency
SWP	State Water Project
SWRCB	State Water Resources Control Board
TCD	Temperature Control Device
USFWS	U.S. Fish & Wildlife Service
WOMT	Water Operations Management Team

Chapter 1 – Background

1.1 Background

The lower American River is a significant resource of considerable interest to fishery management agencies, the public and the U.S. Bureau of Reclamation (Reclamation). Reclamation is responsible for operating the Folsom/Nimbus Dam complex to meet local and downstream water demands, regulatory requirements, and fish habitat needs. Reclamation has a need to consider its operations as they relate to lower American River (LAR) instream resources, and other concerns of fisheries agencies that have regulatory and fish management responsibilities, as well as to provide the public with a forum to provide and exchange information.

In 1996, Reclamation established a working group for the LAR, known as the American River Operations Group (a.k.a., ARG). Reclamation is the lead coordinator of the ARG, bringing together those who have either a legislated or resources-specific interest in the operation of Folsom Dam and Reservoir, and the LAR. The formal members include agencies with trust responsibilities for fisheries resources in the LAR: Reclamation, the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish and Game (CDFG), and Sacramento Area Water Forum (Water Forum). The ARG convenes monthly or more frequently, if needed, with the purpose of providing fishery updates and reports for Reclamation to help manage temperatures and flows for fish resources in the LAR.

The American River Division includes facilities that provide conservation of water on the American River for flood control, fish and wildlife protection, recreation, protection of the Delta from intrusion of saline ocean water, irrigation and municipal and industrial water supplies, and hydroelectric power generation. Initially authorized features of the American River Division included Folsom Dam, Lake and Powerplant; Nimbus Dam and Powerplant; and Lake Natoma. Releases from Folsom Dam are re-regulated approximately seven miles downstream by Nimbus Dam. This facility is also operated by Reclamation as part of the Central Valley Project (CVP). Nimbus Dam creates Lake Natoma, which serves as a forebay for the diversions to the Folsom South Canal.

Reclamation continues to work with the Water Forum, NMFS, CDFG, and other interested parties to integrate a revised flow management standard for the LAR into CVP operations and water rights. Until this action is adopted by the State Water Resources Control Board, the minimally legal required flows will be defined by D-893, which states that, in the interest of fish conservation, releases should not ordinarily fall below 250 cfs between January 1 and September 15th, or below 500 cfs at other times.

Water temperature control operations in the LAR are affected by many factors and operational tradeoffs. These include available cold water resources, Nimbus release schedules, annual hydrology, Folsom power penstock shutter management flexibility, Folsom Dam Urban Water Supply Temperature Control Device (TCD) management, and Nimbus Hatchery operations and maintenance. Shutter and TCD management provide the most operational flexibility in controlling downstream temperatures.

On June 4, 2009, the NMFS issued its Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project (NMFS BiOp)[1]. The ARG was included amongst the four Fisheries and Operations Technical Teams whose function it is to make recommendations for adjusting operations to meet contractual obligations for water delivery and to minimize adverse effects on listed anadromous fish species (see Section 11.2.1.1).

There are several Reasonable and Prudent Alternative (RPA) actions in the NMFS BiOp that discuss minimal flow requirements and temperature objectives for the LAR: Action II.1.; "Lower American River Flow Management" and Action II.2; "Lower American River Temperature Management". The objectives of these RPA actions are to provide minimum flows for all stages of steelhead and to maintain suitable temperatures to support over-summer rearing of juvenile steelhead. An Annual Operations and Temperature Management Plan is prepared for NMFS' consideration that takes into consideration discretionary and non-discretionary actions under Reclamation's authority using iterative modeling techniques (i.e., Coldwater Management Pool model-see Appendix 2D) to determine whether Reclamation is likely to meet the temperature target throughout the season.

Reclamation convenes the ARG to obtain recommendations. If consensus cannot be achieved within the ARG, the ARG advises NMFS, and NMFS makes a recommendation to the WOMT, per standard operating procedures.

1.2 Membership

The ARG consists of representatives from Reclamation, USFWS, NMFS, CDFG, and the Water Forum. ARG member agencies and the lead contacts are:

Bureau of Reclamation (Reclamation)

Russ Yaworsky – LAR Operator

Bonnie Van Pelt – ARG group facilitator

U. S. Fish and Wildlife Service (USFWS)

Nick Hindman (through August 2011)

Julie Zimmerman (new as of September 2011)

Craig Anderson (new as of September 2011)

National Marine Fisheries Service (NMFS)

Gary Sprague

[1] The NMFS BiOp is available online at: http://swr.nmfs.noaa.gov/ocap.htm

California Department of Fish and Game (CDFG)

Robert Vincik

Sacramento Area Water Forum

Rod Hall

Chapter 2 – Summary of ARG Discussions

The following agenda items were discussed at monthly ARG meetings from October 2010 through September 2011. Meeting notes and supplemental ARG documents are sent to group members shortly after each meeting.

2.1 Monthly Discussion Topics

- Fish monitoring
- Water operations and water quality (flows measured at Nimbus Dam, temperatures at Watt Avenue)
- American River RPA Actions (NMFS 2009 RPA with 2011 amendments at pages 38-46); key actions summarized below:

Chapter 3 – Water Operations Summary

This chapter briefly describes American River operations for water year 2011, pertaining to RPA Actions II.1, II.2, and II.4.

3.1 Action II.1 – Lower American River Flow Management

RPA Action II.1 provides minimum flow criteria for all steelhead life stages, as specified by the Water Forum's Flow Management Standard (FMS). Figure 1 is a summary of river releases and Folsom Lake storage for October 2010 through September 2011. Note that high river releases from late November 2010 through mid-July 2011 are primarily for flood control and to manage spring/summer filling of the lake. The Minimum Required Release (MRR) prescribed by the FMS is also shown in the figure. Releases as prescribed by the MRR occurred from October through November 22nd.

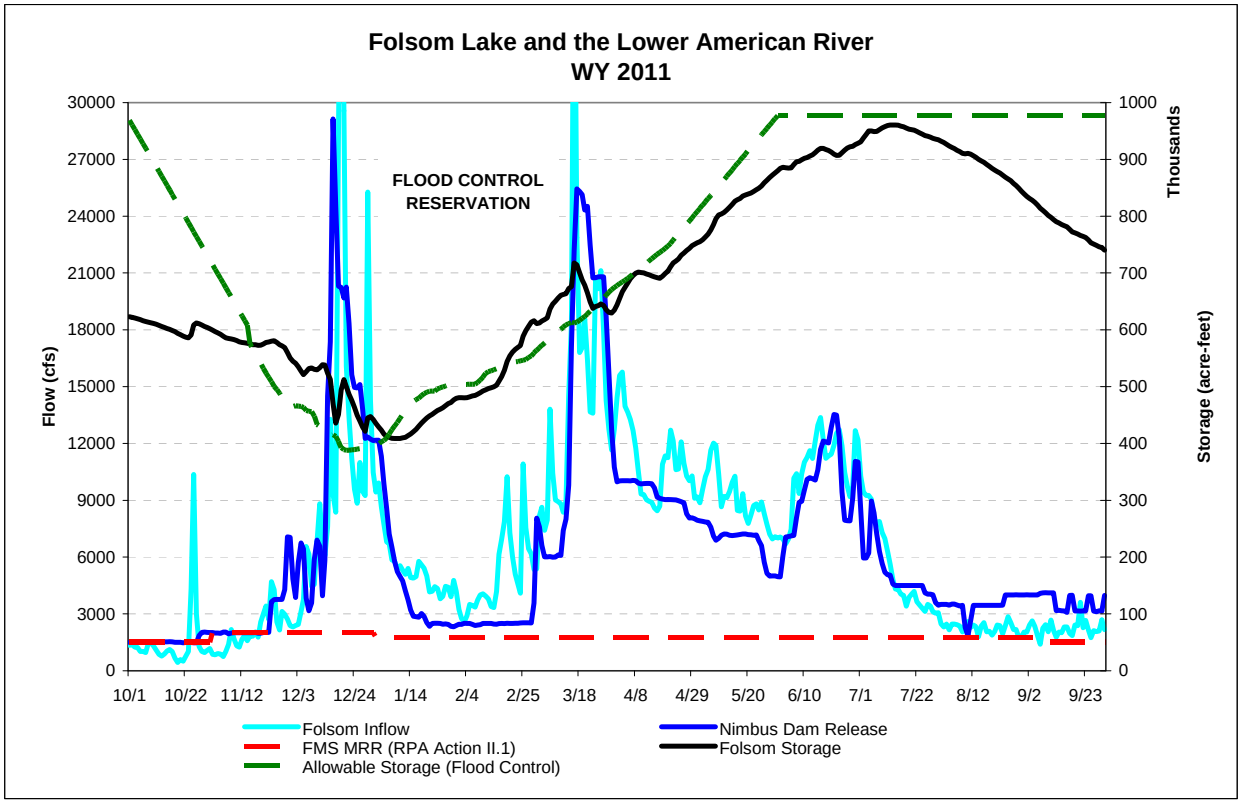

Figure 1: Summary of Folsom Lake and American River Flows

The Nimbus Dam release to the American River is shown again on Figure 2. In addition, the primary reasons for release changes to the American River are identified on the figure.

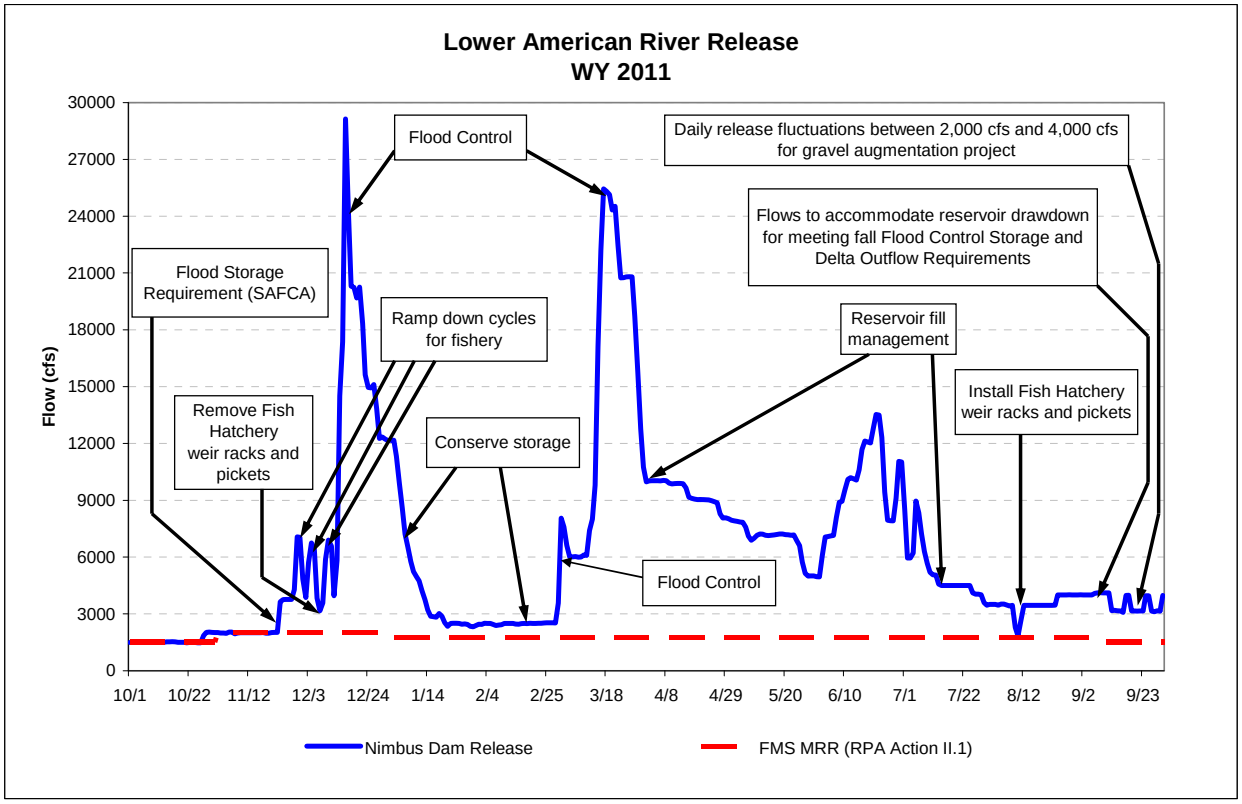

Figure 2: Summary of American River Release at Nimbus Dam

Table 1 contains a summary of release changes from Nimbus Dam indicating the purpose of the operational change. Reclamation has made provisions to notify the public of potential safety or high flow considerations, when appropriate. Several flow management adjustments were made for fish purposes. These included:

1. In late November through mid-December, three multiday pulses of water were released from Folsom Reservoir increase flood storage as shown in Figure 3. The manner in which the water was released was to avoid fish spawning at higher elevations, at which the redds could not be kept wetted after the flows recede. To achieve this, the duration of higher flows were limited to three days (plus ramping), then brought back down for several days before again increasing flows. The process could not be maintained more than three pulses since Reclamation was operating under flood control operations.

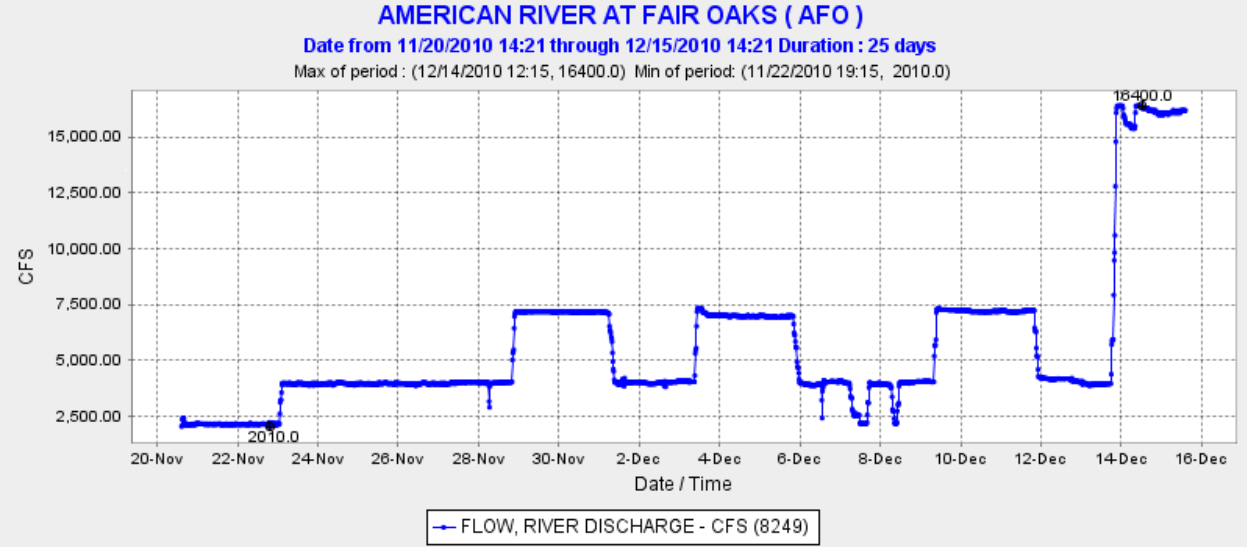

Figure 3: November – December 2010 Flows at Fair Oaks

2. Flows were decreased on December 7-8, 2010, to remove the hatchery weir.

3. Flows were decreased for the installation of the hatchery weir on August 9-11, 2011. The weir was installed earlier this year in response to the high number of fish that were upstream of the weir the previous year.

4. In September, flows were reduced during the day to allow for three weeks of low flows for the implementation of a gravel augmentation project as shown in Figure 4. In an average water year, little manipulation of flow would have been required. With the higher flows this year, it would not have been possible to place the gravel in the river without lowering the flows. To evacuate water from the reservoir, flows were increased at night and on the weekends in order to limit impacts to the macroinvertebrate population that had established at higher flows.

In addition to flow modifications for fish purposes, Reclamation had requested and was granted a reduction of the ramping rate for the July 4th holiday weekend for human safety in anticipation of high human activity levels on the river.

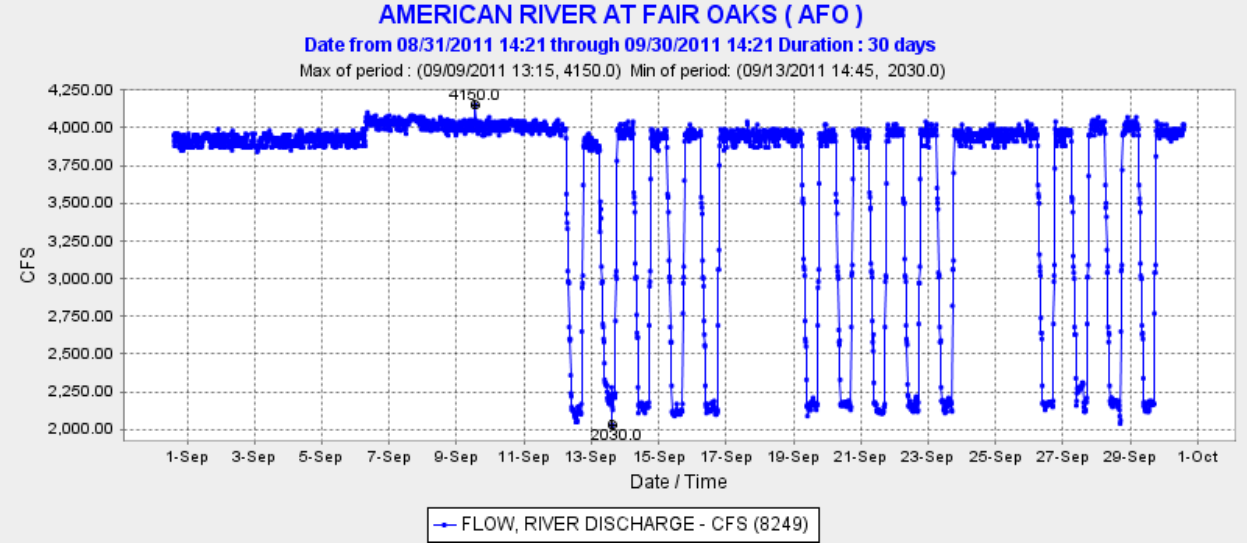

Figure 4: August – September 2011 Flows at Fair Oaks

Table 1: Release Changes at Nimbus Dam

Start Date	End Date	Release	Comment
09/16/10	09/16/10	Decrease	Conserve storage; FMS MRR
10/27/10	10/27/10	Increase	FMS MRR
11/23/10	11/23/10	Increase	SAFCA Flood Control Diagram - reservoir drawdown
12/01/10	12/01/10	Decrease	Ramp down cycle for fishery
12/03/10	12/03/10	Increase	SAFCA Flood Control Diagram - reservoir drawdown
12/05/10	12/05/10	Decrease	Ramp down cycle for fishery
12/07/10	12/08/10	Decrease	Temporary flow reduction for removal of Nimbus Fish Hatchery weir pickets & racks
12/08/10	12/08/10	Increase	SAFCA Flood Control Diagram - reservoir drawdown
12/11/10	12/11/10	Decrease	Ramp down cycle for fishery
12/13/10	12/15/10	Increase	Flood control releases; SAFCA Flood Control Diagram - reservoir drawdown
12/17/10	01/09/11	Decrease	Reduced flood control releases, inflows receding; SAFCA Flood Control Diagram.
01/11/11	01/21/11	Decrease	Conserve storage
03/01/11	03/01/11	Increase	Reservoir fill management for incoming storms
03/03/11	03/04/11	Decrease	Conservation of storage - inflows receding
03/12/11	03/15/11	Increase	Reservoir fill mgmt for anticipated increasing inflows
03/16/11	03/16/11	Increase	Flood control release
03/22/11	03/29/11	Decrease	Inflows receding; reduced flood control releases
03/30/11	05/07/11	Decrease	Reservoir fill management - receding inflows
05/25/11	05/27/11	Decrease	Temporary release reduction for the Memorial Day Weekend
06/02/11	06/20/11	Increase	Reservoir fill management - increasing snowmelt inflow
06/23/11	06/24/11	Decrease	Release reductions for the weekend before Independence Day Weekend
06/28/11	06/28/11	Increase	Release increase for expected rainstorm
07/01/11	07/01/11	Decrease	Reservoir fill management - inflows receding; release reduction before Independence Day Weekend
07/04/11	07/04/11	Increase	Reservoir fill management - increasing snowmelt inflow
07/06/11	07/10/11	Decrease	Reservoir fill management - inflows receding
07/13/11	07/29/11	Decrease	Conserve storage
08/09/11	08/11/11	Decrease	Temporary release reductions to remove debris and install the fish hatchery weir
08/24/11	08/24/11	Increase	Storage management
09/12/11	09/29/11	Dec-Inc	Daily release fluctuations between 2,000 cfs and 4,000 cfs during the work-week for gravel augmentation project; flows maintained at 4,000 cfs during the weekend

3.2 Action II.2 - Lower American River Temperature Management

Figure 5 is a summary of temperature operations from October 2010 through September 2011, in which Reclamation met the temperature requirements at the temperature compliance point. As stated in RPA Action II.2, a draft Temperature Management Plan is submitted to NMFS for review by May 1st. The plan includes several temperature model runs with the objective to achieve a temperature (mean daily) target at Watt Avenue Bridge. The runs incorporate the latest operation's forecast (inflow, outflow and storage). The selected plan requires NMFS approval, with input from members of the ARG. The plan is updated every month based on the latest hydrology and cold-water pool conditions. NMFS must concur on proposed deviations from the plan that may reduce the likelihood that the temperature objective will be met. Elements of the Temperature Management Plan include identification that all non-discretionary actions are met, and that non-discretionary deliveries conform to the plan. Reclamation and NMFS met this year to discuss difficulties associated with meeting these elements of the Temperature Management Plan and how they can be met. Reclamation identified that they will develop the information and how to present the information for these elements, and provide this information to NMFS for further discussion.

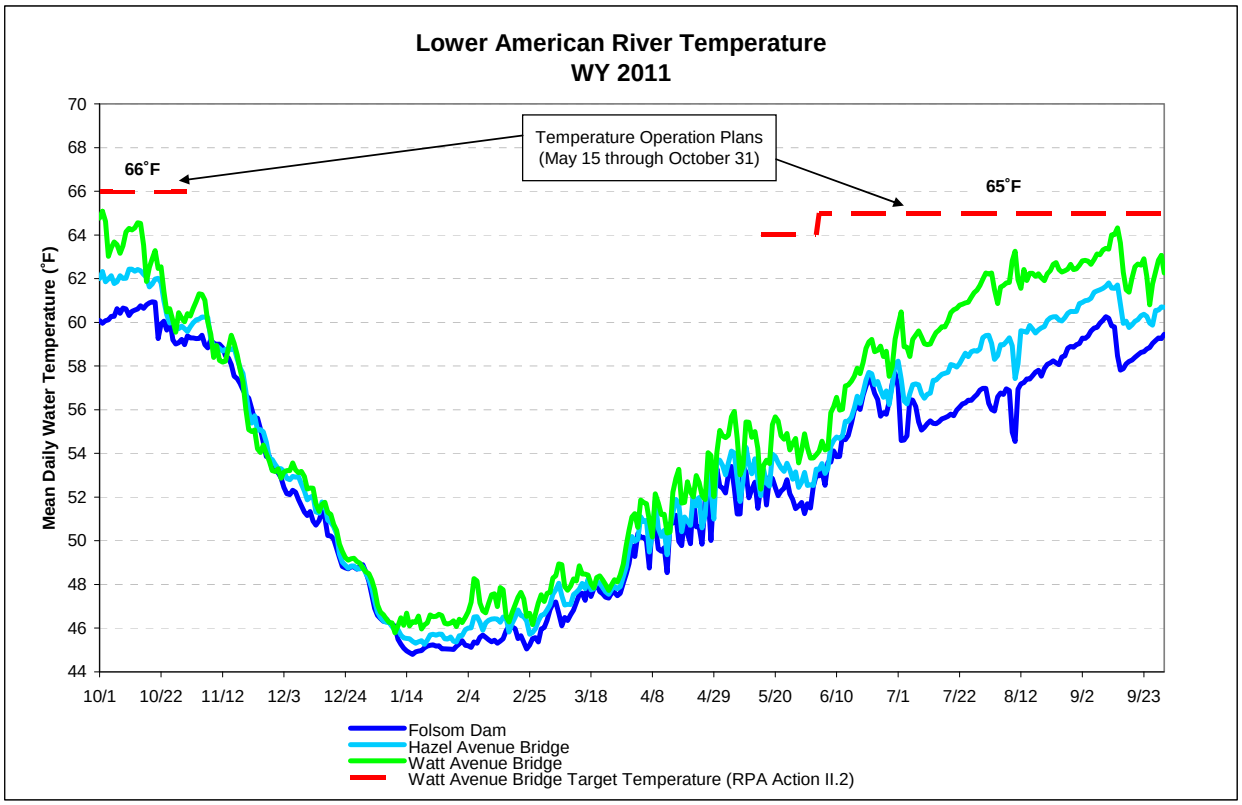

Figure 5: Summary of Temperature in the Lower American River

Table 2 is a list of Folsom Dam temperature shutter and power penstock blending operations taken to meet downstream temperature requirements.

Table 2: Folsom Dam Temperature Shutter Changes and Power Penstock Blending Operations

Date	Operation
10/21/2010	Lower and middle sets of shutters raised on Folsom Unit 1
11/06/2010	Folsom Unit 1 targeted at approximately 20% of the daily load
11/13/2010	Folsom Unit 1 targeted at approximately 40% of the daily load
11/16/2010	Folsom Unit 1 targeted at approximately 60% of the daily load
11/19/2010	Folsom Unit 1 targeted at approximately 80% of the daily load
11/22/2010	Lower set of shutters raised on Folsom Unit 3
11/22/2010	Unit load preferences removed – all shutters raised on operating units
02/25/2011	Lower and middle sets of shutters lowered on Folsom Unit 1
02/28/2011	Lower and middle sets of shutters lowered on Folsom Unit 3
03/22/2011	Upper set of shutters lowered on Folsom Unit 1
03/23/2011	Upper set of shutters lowered on Folsom Unit 3
08/01/2011	Upper set of shutters raised on Folsom Unit 3
08/02/2011	Load maximized on Folsom Unit 1
08/09/2011	Load maximized on Folsom Unit 3
08/11/2011	Load maximized on Folsom Unit 1
08/13/2011	Folsom Unit 3 targeted at approximately 30% of the daily load
08/24/2011	Load maximized on Folsom Unit 1
09/12/2011	Folsom Unit 3 targeted at approximately 50% of the daily load
09/14/2011	Upper set of shutters raised on Folsom Unit 1
09/14/2011	Unit load preferences removed – all units in same shutter configuration

3.3 Action II.4 - Minimize Flow Fluctuation Effects

The goal of RPA Action II.4 is to reduce stranding and isolation of juvenile steelhead through ramping protocols, from January 1 through May 30; and to minimize the occurrence of flows exceeding 4,000 cfs throughout the year, except as necessary for flood control or in response to high inflow events.

Ramping protocols were met from January 1 through May 30; however, deviations from the ramping protocols occurred from May 31 through December 31 for the reasons described in Table 3. These deviations were coordinated with NMFS, USFWS, and CDFG.

Table 3: Ramping Rate Deviations from May 31 through December 31

Start Date	End Date	Reason
12/01/2010	12/01/2010	Ramp down cycle to reduce impact on fishery due to high sustained releases to meet flood storage requirement
12/05/2010	12/05/2010	Ramp down cycle to reduce impact on fishery due to high sustained releases to meet flood storage requirement
12/07/2010	12/08/2010	Remove Fish Hatchery weir racks and pickets
12/11/2010	12/11/2010	Ramp down cycle to reduce impact on fishery due to high sustained releases to meet flood storage requirement
06/23/2011	06/24/2011	Ramp down to provide lower flows during weekend before holiday weekend
07/01/2011	07/01/2011	Ramp down to provide lower flows during holiday weekend
08/09/2011	08/11/2011	Remove debris around piers and install Fish Hatchery weir racks and pickets
09/12/2011	09/29/2011	Daily release fluctuations between 2,000 cfs and 4,000 cfs during the work-week for gravel augmentation project; flows maintained at 4,000 cfs during the weekend

Chapter 4 – Monitoring

4.1 Monitoring Activities

In addition to the carcass and redd surveys, this year there were several additional fish monitoring activities. Bi-weekly updates and an end of survey recapitulation were sent to

NMFS summarizing the findings from the Central Valley steelhead spawning survey in April 2011. Due to higher flows and cooler water temperatures than average, Reclamation monitored down ramping events to assess the potential for isolation and stranding of salmonids. This occurred associated with the large down ramping event in March and with the down ramping in August for the installation of the hatchery weir. The monitoring in March identified isolation of a small number of steelhead and Chinook salmon. Rescue measures were not implemented because the pools would likely reconnect after the survey, the fish were stressed and handling would have increased the stress to which they were exposed. A summary of finding from the two surveys conducted (March 31st and April 1st) was sent via email to NMFS and the other fisheries agencies represented at the ARG. The August monitoring did not identify any isolated or stranded salmonids. A report documenting the findings from the August 9th survey was sent to NMFS. In addition, Reclamation conducted a pilot tracking study of hatchery steelhead. The pilot tracking study data will hopefully help in determining which sites we should concentrate on in terms of improving habitat and lead to a better understanding of long and short range movements of hatchery fish. Information collected this year associated with high flows and colder water temperatures will likely be useful in assessing steelhead behavior, rearing, and migratory patterns in future years with similar conditions. The ARG has had preliminary discussions of how to best use existing monitoring data to evaluate the RPA actions, but has not developed a formal assessment process at this time.

Chapter 5 – Recommendations

5.1 Recommendations

1. Reclamation and NMFS will continue to coordinate elements of the RPA in the Temperature Management Plan.

2. Reclamation should continue to implement fish monitoring measures when feasible in association with unusual events, for which there is little or no data.